

Appl. No. 09/708,036

11/8/2000 FD

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. (Cancelled)

2. (Currently amended) A method as claimed in claim ~~1~~<sup>2</sup> and comprising the step of representing a plurality of the processing elements of the topology engine by different instances of a respective processor, whereby the topology engine has a smaller number of processors than processing elements.

3. (Currently amended) A method ~~as claimed in claim 1~~ of addressing physical problems of a topological network, comprising the steps of:

representing a topology of the network by a plurality of processing elements interconnected via a connection matrix, said processing elements and connection matrix constituting a topology engine;

supplying queries representing physical problems of the network from a host processor of the network to the topology engine;

processing the queries in the processing elements of the topology engine in accordance with the topology of the topology engine; and

supplying responses to the queries from the topology engine to the host processor;

wherein each processing element of the topology engine has a respective address and the connection matrix communicates packets between the processing elements using their respective addresses, wherein the queries and responses are supplied in the form of packets containing information relating to the queries and responses, and the step of processing the

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queries comprises communicating packets between the processing elements of the topology engine and processing the packets in dependence upon information in the packets and information stored in the processing elements.

3 ~~4~~. (Original) A method as claimed in claim ~~3~~<sup>1</sup> and including the step of providing said information stored in the processing elements from the host processor of the network.

4 ~~5~~. (Original) A method as claimed in claim ~~4~~<sup>3</sup> wherein said information stored in the processing elements comprises, for each processing element, the address of each other processing element for which a connection is provided via the connection matrix, and at least one parameter associated with such connection.

5 ~~6~~. (Currently amended) A topology engine comprising a plurality of processing elements and a connection matrix for interconnecting the processing elements, arranged for carrying out the method of claim ~~4~~<sup>1</sup>.

7. (Cancelled)

7 ~~8~~. (Currently amended) A method as claimed in claim ~~7~~<sup>6</sup> wherein the connection engine comprises a plurality of processors each having a plurality of different instances constituting respective ones of the processing elements, whereby the connection engine has a smaller number of processors than the number of network devices of the communications network.

6 ~~9~~. (Currently amended) A method as claimed in claim 7 of determining connection paths in a communications network having connections between network devices managed by a host processor of the network, comprising the steps of:  
representing a topology of said network by a topology of a connection engine,  
the connection engine comprising processing elements representing respective network devices

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and connections between the processing elements representing respective connections between the network devices;

supplying from the host processor to the connection engine a connection search request identifying start and end network devices for a connection;

in response to the connection search request, communicating information between processing elements of the connection engine to determine a connection path between processing elements of the connection engine representing the start and end network devices for said connection; and

supplying information identifying the connection path from the connection engine to the host processor;

wherein each processing element of the connection engine has a respective address and the connections between the processing elements are constituted by packet communications using the respective addresses of the processing elements.

8 10. (Original)

6  
A method as claimed in claim 8 wherein the connection search request comprises a connection search packet addressed to the processing element of the connection engine representing the start network device for the connection.

9 11. (Original)

8  
A method as claimed in claim 10 wherein the step of communicating information between processing elements of the connection engine to determine said connection path comprises propagating connection search packets successively from processing elements receiving connection search packets to other processing elements connected thereto, the successively propagated connection search packets being supplemented with the addresses of the processing elements via which they are propagated, until at least one connection search packet reaches the processing element representing the end network device for the connection.

10 12. (Original)

8  
A method as claimed in claim 10 wherein said information identifying said connection path is supplied from the connection engine to the host processor in a packet from the processing element of the connection engine representing the end network device

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for the connection.

11 13. (Currently amended) A method as claimed in claim 7<sup>6</sup> and further comprising the step of supplying from the host processor to the connection engine information for maintaining in the connection engine a record of connections in the communications network.

12 14. (Currently amended) A connection engine comprising a plurality of processing elements and a connection matrix for interconnecting the processing elements, arranged for carrying out the method of claim 7<sup>6</sup>.

15. (Cancelled)

14 16. (Currently amended) A method as claimed in claim 15<sup>13</sup> wherein the connection engine comprises a plurality of processors each having a plurality of different instances constituting respective ones of the processing elements, whereby the connection engine has a smaller number of processors than the number of network devices of the communications network.

13 17. (Currently amended) A method as claimed in claim 15 of determining connection paths in a communications network having connections between network devices managed by a host processor of the network, comprising the steps of:  
representing each network device by a respective processing element of a connection engine;  
representing each connection between the network devices by a respective connection between the processing elements of the connection engine representing the respective network devices;  
supplying from the host processor to the connection engine information for maintaining in the connection engine a record of connections in the communications network;  
supplying from the host processor to the connection engine a connection search

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request identifying start and end network devices for a connection;

in response to the connection search request, communicating information between processing elements of the connection engine, via the connections between the processing elements and in dependence upon the record of connections maintained in the connection engine, to determine a connection path between processing elements of the connection engine representing the start and end network devices; and

supplying information identifying the connection path from the connection engine to the host processor;

wherein each processing element of the connection engine has a respective address and the connections between the processing elements are constituted by packet communications using the respective addresses of the processing elements.

15 <sup>13</sup> 18. (Original) A method as claimed in claim 17 wherein the connection search request comprises a connection search packet addressed to the processing element of the connection engine representing the start network device for the connection, and said information identifying said connection path is supplied from the connection engine to the host processor in a packet from the processing element of the connection engine representing the end network device for the connection.

16 <sup>15</sup> 19. (Original) A method as claimed in claim 18 wherein the step of communicating information between processing elements to determine said connection path comprises propagating connection search packets successively from processing elements receiving connection search packets to other processing elements connected thereto, the successively propagated connection search packets being supplemented with the addresses of the processing elements via which they are propagated.

17 20. (Currently amended) A connection engine comprising a plurality of processing elements and a connection matrix for interconnecting the processing elements, arranged for carrying out the method of claim 15 <sup>13</sup>.